M-TEC Turbo-Systems
for AMIGA 1200

First of all may we compliment you on the excellent choice you have made in buying this state-of-the-art M-TEC product. The M-TEC brand stands for quality and first class service.
We wish you many hours of sheer enjoyment and quick working with your new M-TEC Product.
Please read the Operation Manual carefully, before you start assembling.

Non-Liability Clause

The M-Tec Hardware Design GmbH shall not accept any liability whatsoever for any damages occurring as the indirect or proximate consequence of the assembly, installation or use of the product and/or the included software.

Warranty

The M-Tec Hardware Design GmbH shall grant a 6 months guarantee period beginning with the date of purchase stated on the original invoice. All hardware and software faults occurring within this period, shall be repaired by M-Tec free of charge. In all such events making this guaranty operative You should contact Your dealer and ask him how to proceed. If you get an RMA please send it back in the original box. This warranty shall not include any follow-up costs e.g. postage fees, packing and third-party costs incurred in wages.
All damages arising from faulty operation, misuse and handling malpractice shall also be exempted from this guaranty obligation.
In the case of claims being made under this guaranty, always enclose invoice copy please.
Assemblies sent without the relevant invoice copy shall generally be repaired with cost.
Assemblies showing signs of use shall, in broad principle, not be exchanged or replaced. Electronic semiconductors can be destroyed due to handling malpractice. They are electrostatically endangered and shall thus be exempted from these guaranty obligation. Consequently they shall be neither exchanged nor replaced.
NotesAlways ensure that your power unit has sufficient capacity. With upgradings (e.g. additional drives, memory, turbo cards, fixed disks etc.) power units with only 3.0 (2.5) amps are surcharged. They must be replaced by power units with 4.5 (4.3) amps and up in order to prevent your Amiga and the relevant accessories from interferences and damages due to insufficient power supply. Information on the capacity of your power unit are given on the case bottom.
Semiconductors are electronical building components such as coprocessors, oscillators, kickROMs,RAM-modules etc.

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Note:
Never use a sharp tool (a screwdriver, for example) for the assembly or disassembly of any elements/ assemblies. They would certainly be damaged. Never use the board to prop your tool when levering up a chip or similar. Resulting damages to the board will consequently lead to a loss of guaranty!!. Any alteration or soldering work effected on the turbo system will result in an exclusion of liability.

3. Problems/References

Before you call Your dealer , please read the following chapter. Should all hints and references fail, please remember to keep your telephone conversation with one of our technicians as shortly and precisely as possible. Prior to telephoning note all your questions and keep all information on your AMIGA and, if necessary, on additional equipment at hand. Your AMIGA board revision is of special importance.

General problems:

1. After installation of the turbo board no functioning or malfunction of the AMIGA. Switch to 68020 operation. If the computer still fails operating, the turbo system might not be plugged in correctly (too loose). Please check.
2. Only with turbo operation no functioning or malfunction. Remove fixed disk. Repeat test using diskettes (Workbench or similar).
3. Turbo board fails after installation of the coprocessor. Check correct installation of coprocessor and oscillator. Non-clocking or defect of the coprocessor will block the whole system. Check jumper positions (clocking of coprocessor, RAM/memory)
4. Crashes during operation, e.g. on drive accesses. Power unit might be too weak. Check whether you are using a power unit with minimum 4.3(4.5) amps (case bottom). Exclusively use such values or higher. Weaker units are surcharged.

Possible RAM problems (memory)
The used modules might not function correctly in this turbo board see chapter II,2 "Memory Banks".
External extensions PCMCIA-boards/PCMCIA-HD
If the turbo system is operated with more than 4 MB, PCMCIA boards/extensions cannot be used due to an overlapping of the memory addresses. Crashes would certainly be the result.
Fixed disks
Many fixed disks of various manufacturers cannot be used with the A1200. While with an already existing fixed disk without any accessories the A 1200 functioned smoothly, with 32Bit memory extensions or turbo boards sudden failures are experienced, such as
1. computer doesn't boot when switched on
2. computer doesn't boot after a reset
3. computer crashes from time to time (data communication error)

faultless operation after disassembly of fixed disk. This is not indicative for a mistake in the turbo system. Replace fixed disk!

For Your Notes

Change-over Facility

Detailed Jumper Projection

II. Product Description

1. General

The turbo system T68030/28 RTC is based on a 6-layer PCB. It uses an MC68030 with integrated instruction and data cache, compatible with the Motorola MC68020 (MC68EC020). In addition, the MC68030 has a Memory Management Unit (MMU). The processor is clocked with double clock rate of an AMIGA1200 i.e. approx. 28 MHz. This clock rate cannot be changed. Optional installation of an arithmetic type MC68881/68882 coprocessor with clock frequencies freely selectable depending on the type. Type and clock rate appoint the speed. AMIGA hardware and operating system (OS) independently recognize the existence of the optionally pluggable arithmetic coprocessor, resulting in an automatic pick-up and use of the same. This is exclusively determined through the applied software.
Additional features are a battery-backed-up real-time clock and a connector for a SCSI interface.

2. Diskette

The supplied diskette comprises some test programs . Some of the test programs need a 68881 or 68882 coprocessor. Should your computer become inoperative after calling one of the programs stored on the diskette, or if the computer needs a warm restart (Ctrl + AMIGA + AMIGA) or switching on/off respectively to take up its function, then your card might lack a coprocessor.

3. Increase of Performance through Turbo Boards

Since the increase in performance depends on the programs used, general performance data cannot be given. However, in order to obtain a general view, we would recommend that you start the test programs on the supplied diskette.First of all, leave the turbo system off and "click" the "ohne CoPro" icon. Follow the statements on the monitor. (This does not work on an american NTSC-version of the AMIGA1200.)
Repeat the process with the turbo system on. If your turbo system is presently not equipped with a coprocessor, care must be taken, that the same program as before is being started (otherwise danger of crash). Only if your turbo system has a coprocessor, the "with CoPro" program can be used. (This does not work on an american NTSC-version of the AMIGA1200.)
The program SetCPU is of much importance for the T 68030/28 turbo system. Through this program the cache of the 68030 can be switched on and off via software. Furthermore there is a possibility to copy the data of the kickstart-ROM into the 32Bit RAM. This will increase the performance of the operating system.

4. Information on SetCPU program

We proceed on the assumption that you are sufficiently experienced in the handling of your AMIGA. A basic introduction cannot be given here. This is especially true for technical questions via the phone. Our technicians have been advised not to answer any question related to the operation of the computer. For handling information concerning your AMIGA please see the AMIGA operation manual.
Copy the SetCPU program from the supplied diskette (Turbo Test) onto your fixed disk (if available). First click the turbo test icon. Then use your mouse to pull the SetCPU drawer from the turbo test window into any desired already opened window (e.g. Work or Workbench). You can also create a drawer in the Work or Workbench window and name it "turbo" for example.
If a fixed disk is still not available, start the program from the diskette direct.

Starting the Program

Click the SetCPU drawer (double click). Another window opens. Now, click the file (icon) SetCPU (should a SetCPU icon not show but only SetCPU.txt, than click the right mouse button to visually display all files via the workbench menu [WORKBENCH/SHOW/ALL FILES]. After the opening of a further window, you can now read in some commands (blinking cursor). Some examples are:

"SetCPU cache" Cache (data and information cache) on
"SetCPU nocache" Cache (data and information cache) off
"SetCPU data cache" only data cache on
"SetCPU data nocache" only data cache off
"SetCPU fastrom" KickROM is copied into 32Bit RAM
"SetCPU nofastrom" procedure canceled
"SetCPU cache fastrom" cache on, kickROM is copied
The experienced user will find additional information and tips in the doc-file (SetCPU.bd).
The program can equally be started via the startup sequence (user startup) using the desired "commands". For the starting of programs via the startup sequence please see the AMIGA manual.

III. Jumper Setting

1. Jumper Function

All jumpers that are not named here or are not described in this instruction must remain unchanged. They serve the adjustment of different placement variants of the turbo board. A change of this basic setting would led to malfunctions and system crashes respectively.
In the annex to this manual you will find a sketch of your turbo board. Only the jumper settings shown there should be noted.

Cache

If this jumper is plugged in (closed, both pins connected) the data- and information caches of the MC68030 are switched off.

Turbo

If this jumper is closed, the turbo system is switched off. The AMIGA now reacts as if no turbo card were available.
the real-time clock is not affected by this measurement.

M0, M1; M2, M3

no jumper closed = 0 MB
M0 closed: = 1 MB
M0, M3 closed = 2 MB
M0 and M1 closed = 4 MB
M0, M1 and M2 closed = 8 MB

Clock

Closing of this jumper enables adjustment of the clock. With this jumper opened, the clock is write protected.

CoProcessor

Here, You can select the clock frequency. Possible settings: 14MHz, 28MHz or async (what means that You have to add an oscillator). For the adequate jumper position please see the annexed sketch.

2. Memory Banks (Modules)

PS/2 modules (32Bit modules with 70 ns or faster) are being used here. It has proved that due to the fact, that the RAM operates with only one wait-state in order to enable maximum RAM performance, some RAM-types (manufacturers) are causing problems (e.g. crashes) You should use RAM-modules form Siemens (B-types), Motorola, IBM, Toshiba, Mitsubishi, Hyandai, Fujitsu and Samsung.

3. Recommendations for Easy Handling

A breaker can be plugged in (don't solder) to replace the jumper 68000 (68K) in order to avoid repeated opening of the bottom flap. It might be necessary to slightly bend the switch connector aside to enable closing of the flap.

IV. Assembly Instructions

1. Before You Start

Careful preparation often helps to avoid installation mistakes and difficulties. We would therefore recommend careful reading of the manual and placing at disposal of the necessary tools. Consider the guaranty clauses of Commodore.

2. Assembly

Switch off your computer
Disconnect your AMIGA from all cables, especially the 110V/220V main voltage
Position the AMIGA - keyboard down - on a blanket for example
Open the trap door in the case bottom
Insert the turbo system into the shaft so that you can see the assembly parts.
Fix the board in front of the 150pin AMIGA-Expansion connector, then press strongly to plug it in.
Close the Trap door.
Ready

Installation of a Coprocessor

Both the MC/XC68881 and the MC/XC68882 with any clock frequency can be used. Consider the case layout of the coprocessor. PGA processors have "little feet", while the connecting ports of the PLCC processors are laterally attached. Always state the type of your casing when placing an order.

Have a careful look at your turbo system. It has two (square) holders. Here you can decide whether to use a PLCC or a PGA coprocessor, of course, you would never use both types at the same time!!! Holders with lateral clamp-type terminals are equipped with a PLCC coprocessor, while a PGA coprocessor is used for the holders with "holes".

Insert the coprocessor as follows:

PLCC

The coprocessor has a slanted "corner" which must match an equally slanted edge in the holder. Often an additional white square impression is to be found on the turbosystem (around the mounting).

PGA

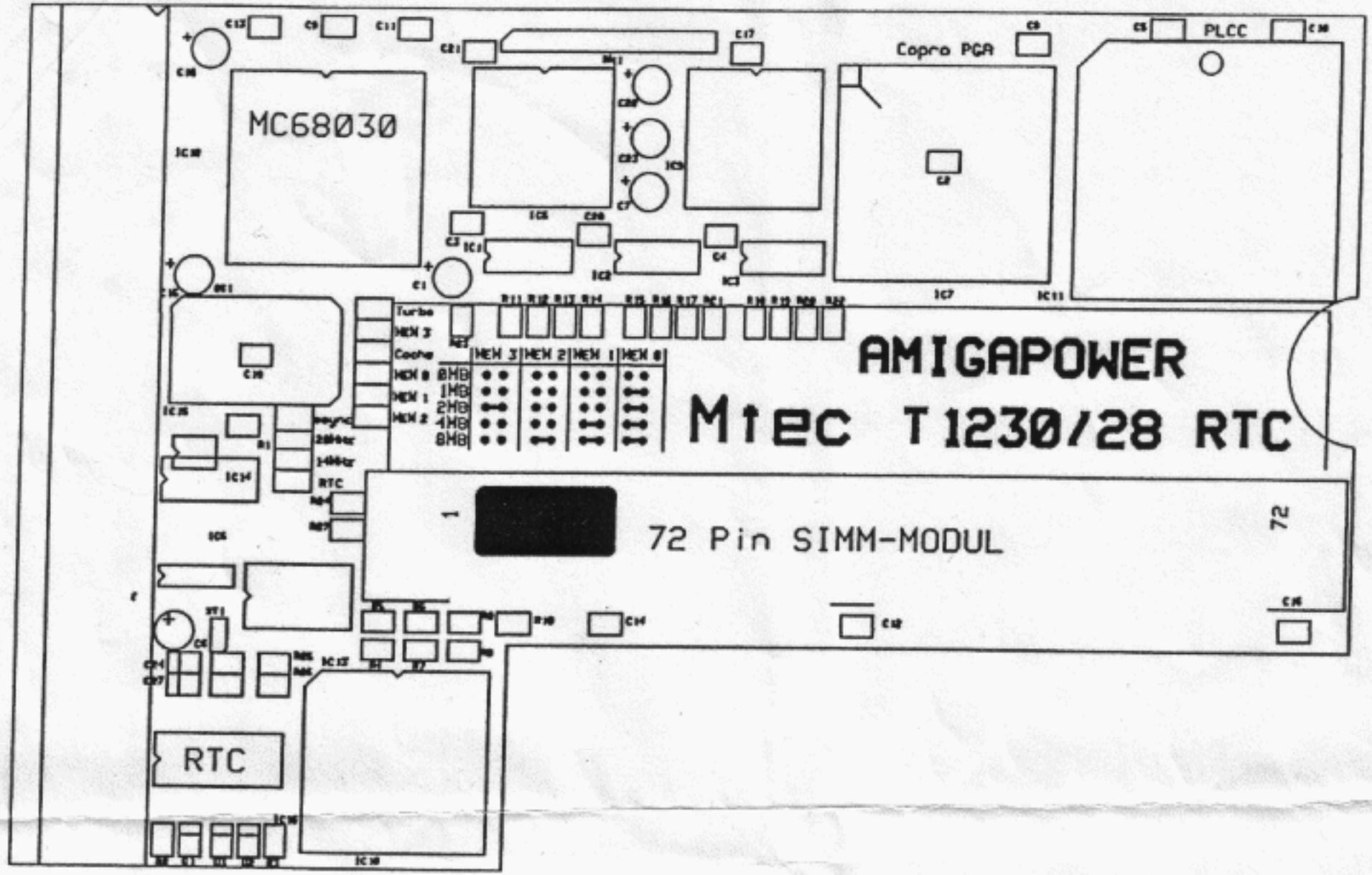
The PGA coprocessor normally has a "golden" cover, which is continued in one corner in the form of a "Y". Sometimes the "golden" cover might simply be slanted. In both cases, however, this defines the "corner" of the coprocessor. It is always easy to find the marking of the holder on the turbo system. Here, too, an existing white printing on the board might be helpful.

Installation of the Oscillator

One "corner" of the oscillator is provided with a dot (seen from above). This dot is easily be located with metal oscillator, whereas a second look might be necessary in the case of plastic oscillators (mostly coined into the plastic). The holder has a distinct indent (centrical) in one narrow side. On installation, the dot must show into the same direction. Here, too, a possibly existing printing on the board can be helpful.

Setting of the Clock

In order to set the hardware clock, open the prefs-drawer of the Workbench. Click the time-icon (double click) and make all necessary adjustments. For more detailed information please see the AMIGA manual.


MC68030
Copro PGA
PLCC
AMIGAPOWER
Mtec T1230/28 RTC
72 Pin SIMM-MODUL
RTC